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EXAMINER

JOHNSON, GREGORY L

ART UNIT

PAPER NUMBER

3691

NOTIFICATION DATE

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/692,067	<b>Applicant(s)</b> TULLY ET AL.	
	<b>Examiner</b> GREGORY JOHNSON	<b>Art Unit</b> 3691	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 June 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-35,82-86 and 91-98 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-35,82-86 and 91-98 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. This communication is in response to the amendment filed June 19, 2009.

#### ***Status of Claims***

2. Claims 1-2, 82 and 95 are amended. Claims 3-13, 15-19, 21, 23-35 and 83-86 are original. Claims 14, 20, 22, 91-94 and 96-97 are as previously presented. Claims 36-81 and 97-90 are canceled. Claim 98 is new. Claims 1-35, 82-86 and 91-98 are pending.

#### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. **Claims 82-86** were previously rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In view of Applicant's amendments, the rejections are withdrawn.

#### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 1-11, 16, 18, 20, 21, 27-31, 82, 94-96 & 98** are rejected under 35 U.S.C. 103(a) as being unpatentable by Mulinder et al., Pub. No. 2002/0073018 (hereinafter Mulinder), in view of Garg et al., Pub. No. 2005/0021530 (hereinafter Garg).

**As per claim 1**, Mulinder teaches an automated brokerage system for processing activity requests related to financial instruments (See abstract, which discusses a system for real-time trading services), the system comprising:

- a plurality of applications configured to generate activity requests related to one or more financial instruments in response to input from remote users (See ¶0009-0011, ¶0043-0045, ¶0062, ¶0064 and Figs. 2, 5 and 5a, which discusses multiple applications/modules, including a price request application program interface (API) for trading securities);
- a data source configured to provide financial instrument quote data, a data repository configured to store customer account data, and an order placement system configured to place one or more orders on a financial instrument trading market, the one or more orders being derived from at least one received activity request (See Abstract, ¶0024, ¶0043-0048, ¶0054-0055 and ¶0064; via quote engine, market maker, data storage system and trading system 21).

Mulinder discloses that it would be obvious to one of ordinary skill to implement the disclosed invention in *one or more computer programs* that are executable on a programmable system including *at least one programmable processor* coupled to receive data and instructions from, and to transmit data and instructions to, a data storage system, at least one input device, and at least one output device (¶0064); however, Mulinder does not explicitly disclose a physical structure / architecture with the following elements:

- a front end layer comprising a plurality of applications configured to generate activity requests;
- an intermediate layer in communication with the front end layer, the intermediate layer comprising a plurality of intermediate layer servers for simultaneously processing the generated activity requests, the intermediate layer servers being configured to provide a set of services in connection with the processing of the activity requests; and
- a back end layer in communication with the intermediate layer.

Garg teaches that a common architecture for a web service system is a tiered structure including a first tier of web servers (Applicant's front end layer), a second tier of application servers (Applicant's intermediate layer), and a third tier of database servers (Applicant's back end layer). Garg also teaches a method and apparatus for allocating resources to a plurality of applications. Garg teaches that servers of a data center may provide computational, storage, communications, or other basic services depending on application needs and data center priorities. Servers may be shared or dedicated to applications depending on resource requirements. For example, server 112 may be shared by multiple applications 114, while server 116 may be dedicated to a single application 118 (Abstract, ¶¶0003, ¶¶0013-0015 and Figs. 2-3).

As stated above, Mulinder discloses that it would be obvious to one of ordinary skill to implement the disclosed invention in *one or more computer programs* that are executable on a programmable system including *at least one programmable processor*. And Garg teaches that a common architecture for a data center providing services

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based on requests from remote users is implemented via tier architecture in which servers may be shared or dedicated to applications depending on resource requirements.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the real-time trading system as disclosed by Mulinder, with the tiered server architecture as disclosed by the Garg, since the claimed invention is a substitution of one known element for another (i.e. distributing computer programs to run on dedicated servers instead of one server), and one of ordinary skill in that art would have recognized that the results of the substitution were predictable. See MPEP 2143 (Rev. 6, Sept. 2007), Rational (B).

In addition, the known work in the field of data network designs (e.g. tiered architecture) could have prompted variations of it for use in either the same field or a different one based on design incentives or other market forces, and the variations would have been predictable to one of ordinary skill in the art. See MPEP 2143 (Rev. 6, Sept. 2007), Rational (F).

In regards to the following element:

- wherein the intermediate layer servers are configured to interact with the back end layer data source, the back end layer data repository, and the back end layer order placement system as necessary to process the received activity requests.

As stated above, Garg teaches that a common architecture for a web service system includes a second tier of application servers is in communication with a third tier of database servers.

Mulinder discloses a system in which *one or more computer programs* that are executable on a programmable system including *at least one programmable processor* coupled to receive data and instructions from, and to transmit data and instructions to, a data storage system, at least one input device, and at least one output device. Mulinder also discloses quote engine 9' that receives (1) price quotes for derivatives from a market maker 10' and (2) real-time market information, such as spot price information and interest rate information, from a real-time market information source 11' (§0048). If and when a client requests a trade by invoking a request trade API that includes the parameters of the price quote, a flow manager 7' receives the trade request and forwards the trade to risk management and trading systems 21' for processing (§0048, §0054-0055, §0064 and Figs. 1, 2 and 2a). (Note: Mulinder discloses, at a minimum, five (5) systems performing five different functions: quote engine, market marker, real-time market information source, risk management system and a trade settlement system).

It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to implement the real-time trading system as disclosed by Mulinder within a tiered architecture as taught by Garg to provide a communication structure in which applications are assigned subset(s) of resources based on application resource

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requirement(s), maintaining a minimization of communication delays between resources, and a bandwidth capacity requirement(s) of the applications (Abstract).

In addition, the known work in the field of data network designs (e.g. tiered architecture) could have prompted variations of it for use in either the same field or a different one based on design incentives or other market forces, and the variations would have been predictable to one of ordinary skill in the art. See MPEP 2143 (Rev. 6, Sept. 2007), Rational (F).

**As per claim 2**, Mulinder does not disclose the following limitation; however, this limitation is taught by Garg:

- wherein the intermediate layer servers comprise a plurality of dedicated servers, each dedicated server being configured to provide a different set of services in connection with the processing of the activity requests (Abstract, ¶0003, ¶0013-0015 and Figs. 2-3). Also see the rejection of claim 1.

**As per claim 3**, Mulinder discloses the following limitations:

- at least one order server configured to receive and process order activity requests (¶0012, ¶0044, ¶0048, ¶0054-0055, ¶0064 and Figs. 2 and 2a; via forward the trade to a trade settlement system 21' for processing);
- at least one customer account server configured to receive and process customer account activity requests (¶0013, ¶0044, ¶0048, ¶0054-0055, ¶0064 and Figs. 2, 2a and 5; via a client requests a trade by invoking a



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request trade API that includes the parameters of the price quote, a flow manager 7' receives the trade request), and

- at least one quote server configured to receive and process quote activity requests, wherein the processing of quote activity requests includes interacting with data source to retrieve the financial instrument quote data therefrom and providing the retrieved financial instrument quote for display to the users (§0011-0013, §0043-0044, §0048, §0054-0055, §0064 and Figs. 2 and 2a; via quote engine 9').

As stated above, Mulinder discloses a system in which *one or more computer programs* that are executable on a programmable system including *at least one programmable processor* coupled to receive data and instructions from, and to transmit data and instructions to, a data storage system, at least one input device, and at least one output device. As interpreted by the Examiner, the one or more computer programs include the quote engine, the modules and managers as illustrated in Fig. 2; and the programmable system including *at least one programmable processor* includes multiple processors (i.e. multiple servers).

Therefore, Mulinder discloses the functional elements of the claim, but not the elements directed to the physical structure / architecture which include:

- front end layer,
- wherein the processing of customer account activity requests includes interacting with the back end layer data repository to retrieve customer

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account data therefrom and providing the retrieved customer account data to the front end applications for display to the users

- back end layer, and
- front layer applications.

Garg teaches that a common architecture for a web service system is a tiered structure including a first tier of web servers (Applicant's front end layer), a second tier of application servers (Applicant's intermediate layer), and a third tier of database servers (Applicant's back end layer). Garg also teaches a method and apparatus for allocating resources to a plurality of applications. Garg teaches that servers of a data center may provide computational, storage, communications, or other basic services depending on application needs and data center priorities. Servers may be shared or dedicated to applications depending on resource requirements. For example, server 112 may be shared by multiple applications 114, while server 116 may be dedicated to a single application 118 (Abstract, ¶¶0003, ¶¶0013-0015 and Figs. 2-3). Also see the rejection of claim 1 above.

It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the real-time trading system as disclosed by Mulinder, with the tiered server architecture as disclosed by the Garg, since the claimed invention is a substitution of one known element for another (i.e. distributing computer programs to run on dedicated servers instead of one server), and one of ordinary skill in that art would have recognized that the results of the substitution were predictable. See MPEP 2143 (Rev. 6, Sept. 2007), Rational (B).

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In addition, the known work in the field of data network designs (e.g. tiered architecture) could have prompted variations of it for use in either the same field or a different one based on design incentives or other market forces, and the variations would have been predictable to one of ordinary skill in the art. See MPEP 2143 (Rev. 6, Sept. 2007), Rational (F).

**As per claim 4**, Mulinder teaches wherein the order server is further configured to interact with the customer account server to obtain customer account data therefrom (See ¶0050 and ¶0064, which discusses processing a transaction utilizing client account information and implementing the method via *one or more computer programs* that are executable on a programmable system including *at least one programmable processor*). Also see the rejection of claim 1 regarding the combined teachings of Mulinder and Garg.

**As per claim 5**, Mulinder teaches wherein the order server is further configured to interact with the quote server to obtain financial instrument activity requests (See ¶0011-0013, ¶0043-0044 and Figs. 2 and 2a, which discusses and illustrates a trade settlement system for processing trades and a quote engine capable of providing a plurality of quotes, each of which has a specified duration, when processing a trade in a security).

**As per claim 6**, Mulinder teaches wherein the intermediate layer further comprises a database schema configured to store data related to receive activity requests (See paragraph 13, 49, & 64, which discusses a conventional database

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management system; and, furthermore, monitoring a clients trading patterns and market activity, thereby creating a client account).

**As per claim 7**, Mulinder teaches wherein the database schema (See paragraph 64, which discusses using a conventional database management system) comprises:

at least one customer database for storing customer-specific data (See paragraphs 13, 43-44, 46, 49-50 and Fig. 1, which discusses monitoring a clients trading patterns, market activity and checking client's credit rating and collateral status with the financial institution operating system 1, thereby accessing a client account); and

at least one order database for storing order-specific data (See paragraphs 12, 44 & 64, which discusses processing a trade in a security).

**As per claim 8**, Mulinder teaches wherein the database schema further comprises at least one trading administration database for storing administrative restrictions related to activity requests (See paragraphs 46 & 49, which discusses spread rules and dealer intervention rules).

**As per claim 9**, Mulinder teaches wherein the database schema further comprises a plurality of the customers databases, a plurality of the orders databases, and a plurality of the trading administration databases (See paragraphs 12, 13, 44, 49, & 64, which discusses a conventional database management system; and, furthermore, monitoring a clients trading patterns and market activity, thereby creating a client account, when processing a trade in a security).

**As per claim 10**, Mulinder teaches an administrator interface for controlling the content of the trading administration database (See paragraphs 44 & 54, which discusses a flow manager who coordinates and processes trades).

**As per claim 11**, Mulinder teaches wherein the administrator interface is configured to provide an administrator with control over restrictions on at least one of the group consisting of a financial instrument-specific basis, a trading market-specific bases, and an option-specific basis (See paragraphs 44 & 54 which discusses a flow manager who coordinates and processes trades based on risk analysis and market volatility).

**As per claim 16**, Mulinder teaches wherein the customer account server include memory resident thereon for storing customer account data that has previously been retrieved from the back end data repository (See paragraphs 13, 43, & 49, which discusses monitoring a clients trading patterns and market activity, thereby creating a client account; and, furthermore, a communication server that manages access to trading date; it is inherent the system contains memory), and wherein the customer account server is further configured to utilize the customer account data that has been stored in the resident memory according to predetermined criteria when processing customer account activity requests (See paragraphs 49 & 50, which discusses client information in relation to dealer intervention rules, including credit related factors).

**Claim 18** recites equivalent limitations to claim 16 and is therefore rejected using the same art and rationale set forth above.

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**As per claim 20**, Mulinder teaches wherein the front end layer and the intermediate layer communicate with each other according to the Internet Protocol Suite (TCP/IP) protocol (See paragraph 43, which discusses communications protocol, including the internet).

**Claim 21** recites equivalent limitations to claim 20 and is therefore rejected using the same art and rationale set forth above.

**As per claim 27**, Mulinder teaches wherein the back end data source comprises at least one quote feed, the at least one quote feed providing quote data in a data format to the quote server, and wherein the quote server is further configured to convert the received quote data to an internal data format upon receipt thereof (See paragraphs 11-13, 43-44, & 46 which discusses a quote engine capable of providing a plurality of quotes, each of which has a specified duration; and, furthermore, utilizing a number of factors when describing price quote generation).

**As per claim 28**, Mulinder teaches wherein the back end data source comprises a plurality of quote feeds, at least two of the quote feeds providing quote data in different data formats, and wherein the quote server is further configured to convert quote data received from each of the quote feeds to the internal data format upon receipt thereof (See paragraphs 11-13, 43-44, & 46, which discusses a quote engine capable of providing a plurality of quotes, each of which has a specified duration; and, furthermore, utilizing a number of factors when describing the price quote generation factor).

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**As per claim 29**, Mulinder teaches wherein the quote data comprises a plurality of quote data types (See paragraphs 11-13 & 43-44, which discusses a quote engine capable of providing a plurality of quotes, each of which has a specified duration), and wherein the system further comprises an administrator interface configured to select, in response to administrator input, which of a plurality of quote feeds are to be used for receiving each of the plurality of quote data types (See paragraph 44, which discusses how a dealer intervention module may be used by a trader to control the pricing and trading activity).

**As per claim 30**, Mulinder teaches wherein the back end layer further comprises a plurality of the data repositories, and wherein the intermediate layer servers are configured to interact with both the back end data repositories when processing activity requests (See paragraph 64, which discusses using a conventional database management system).

**As per claim 31**, Mulinder teaches an approval desk interface configured to provide a person with control over whether to approve or reject order activity requests routed thereto, and wherein the order server is further configured to determine whether an activity request is to be routed to the approval desk (See paragraph 51, which discusses how the trader may reject or modify the price request).

**As per claim 82**, Mulinder discloses a method for processing activity requests related to financial instruments, the method comprising:

- an automated financial instrument brokerage system (See Abstract and Figs. 1 and 2, which discusses and illustrates a system for real-time trading services);
- providing a plurality of heterogeneous applications that are configured to generate activity requests related to financial instruments in response to user input (See ¶0009-0011, ¶0043-0045, ¶0062, ¶0064 and Figs. 2, 5 and 5a, which discusses multiple applications/modules, including a price request application program interface (API) for trading securities).

Mulinder discloses that it would be obvious to one of ordinary skill to implement the disclosed invention in *one or more computer programs* that are executable on a programmable system including *at least one programmable processor* coupled to receive data and instructions from, and to transmit data and instructions to, a data storage system, at least one input device, and at least one output device (¶0064); however, Mulinder does not explicitly disclose the following elements:

- providing a first layer and a second layer, the first layer for interacting with users to generate activity requests, wherein the second layer is in communication with the first layer, and wherein the second layer is configured to process activity requests;
- providing a common interface for each of the heterogeneous applications to communicate the activity requests to the second layer;



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- receiving activity requests at the second layer from the common interfaces; and
- processing activity requests in the second layer independently of the application from which those activity requests originated.

Garg teaches that a common architecture for a web service system is a tiered structure including a first tier of web servers (Applicant's front end layer), a second tier of application servers (Applicant's intermediate layer), and a third tier of database servers (Applicant's back end layer). Garg also teaches a method and apparatus for allocating resources to a plurality of applications in which instrumentation is gathered for work requests to be processed by the applications. Garg teaches that servers of a data center may provide computational, storage, communications, or other basic services depending on application needs and data center priorities. Servers may be shared or dedicated to applications depending on resource requirements. For example, server 112 may be shared by multiple applications 114, while server 116 may be dedicated to a single application 118 (Abstract, ¶0003, ¶0013-0015 and Figs. 1-3).

As stated above, Mulinder discloses that it would be obvious to one of ordinary skill to implement the disclosed invention in *one or more computer programs* that are executable on a programmable system including *at least one programmable processor*. And Garg teaches that a common architecture for a data center providing services based on requests from remote users is implemented via tier architecture in which servers may be shared or dedicated to applications depending on resource requirements.

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Therefore, it would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the real-time trading system as disclosed by Mulinder, with the tiered server architecture as disclosed by the Garg, since the claimed invention is a substitution of one known element for another (i.e. distributing computer programs to run on dedicated servers instead of one server), and one of ordinary skill in that art would have recognized that the results of the substitution were predictable. See MPEP 2143 (Rev. 6, Sept. 2007), Rational (B).

In addition, the known work in the field of data network designs (e.g. tiered architecture) could have prompted variations of it for use in either the same field or a different one based on design incentives or other market forces, and the variations would have been predictable to one of ordinary skill in the art. See MPEP 2143 (Rev. 6, Sept. 2007), Rational (F).

**As per claims 94-96**, Mulinder does not explicitly disclose the following elements however, these elements are disclosed by Garg:

- wherein the front end layer comprises at least one front-end server, the at least one front-end server being configured to execute the plurality of applications (Abstract, ¶¶0003, ¶¶0013-0015 and Figs. 2-3);
- wherein the at least one front-end server is further configured to distribute activity requests to the plurality of intermediate layer servers based on activity request type (Abstract, ¶¶0003, ¶¶0013-0015 and Figs. 2-3); and

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- wherein the customer account server comprises a web-to-back office (WBO) server that acts as a gateway between the back end layer of the system and a customer using a website provided by the front end layer.

**As per claim 98**, the combination of Mulinder and Garg disclose the following elements:

- wherein the second layer comprises a plurality of dedicated servers, at least one of the dedicated servers being configured to receive and process activity requests from the first layer, at least one of the dedicated servers being configured to receive and process activity requests from the first layer, and at least one of the dedicated servers being configured to receive and process activity requests from the first layer (Garg: Abstract, ¶¶0003, ¶¶0013-0015 and Figs. 2-3);
- wherein the activity requests are order activity requests (Mulinder: ¶¶0044; via receiving price request from client), quote activity requests (Mulinder: ¶¶0044; via providing price quote to clients) and customer account activity requests (Mulinder: ¶¶0050; via checking credit rating and collateral status with the financial institution),
- wherein the activity request processing step comprises interacting with a data repository and data source (Mulinder: ¶¶0048, ¶¶0054-0055, ¶¶0064; via database and real-time market information source),

- that are in communication with the second layer (Mulinder: ¶0064; via computer programs and processors; combined with Garg: Abstract, ¶0003, ¶0013-0015 and Figs. 2-3),

the method further comprising:

- routing generated activity requests through the common interface from the first layer to an appropriate one of the second layer dedicated servers based on a type for the generated activity request (Garg: Abstract, ¶0003, ¶0013-0015 and Figs. 2-3).

**7. Claims 12-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulinder and Garg as applied to claim 3 above, and further in view of Bowman-Amuah, Pat. No. 6,578,068 (hereinafter Bowman-Amuah).

**As per claim 12**, Mulinder teaches wherein the intermediate layer further comprises: a plurality of the order servers (See paragraphs 12 & 44, which discusses processing a trade in a security; and trade settlement system).

However, Mulinder does not disclose a load balancer that interfaces with the front end applications with the plurality of order servers, the load balancer being configured to distribute order activity requests among the plurality of order servers.

Bowman-Amuah discloses a system and method for distributing information amongst a client and server components for optimizing usage of resources.

Both Mulinder and Bowman-Amuah disclose methods and systems for distributing information within a trading or ordering contexts. Bowman-Amuah discloses a load balancer that mediates the request, otherwise known as workload balancing (See

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figure 151 and column 98, lines 22-49, which discusses how load balancing functionality effectively reduces the number of connections to databases, conserves the resources of the data servers, and increases throughput of the system). Therefore, it would have been obvious to someone of ordinary skill in the art at the time the invention was made to modify Mulinder to include a load balancer capable of distributing ordering activity requests over a plurality of servers as taught by Bowman-Amuah in order to combine the known features of trading systems and load balancing to achieve the predictable result of utilizing load balancing in a trading system to conserve resources and increase throughput.

**As per claim 13**, Mulinder teaches wherein the intermediate layer further comprises: a plurality of the customer account servers (See paragraph 13 & 49, which discusses monitoring a client's trading patterns and market activity, thereby creating a client account; and credit module, computer programs, and processors ¶0064).

However, Mulinder does not disclose a load balancer that interfaces the front end applications with the plurality of customer account servers, the load balancer being configured to distribute customer account activity requests among the plurality of customer account servers.

Bowman-Amuah discloses a load balancer that mediates the request, otherwise known as workload balancing (See figure 151 and column 98, lines 22-49, which discusses how load balancing functionality effectively reduces the number of connections to databases, conserves the resources of the data servers, and increases throughput of the system). Therefore, it would have been obvious to someone of

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ordinary skill in the art at the time the invention was made to modify Mulinder to include a load balancer capable of distributing customer activity requests over a plurality of servers as taught by Bowman-Amuah in order to combine the known features of trading systems and load balancing to achieve the predictable result of utilizing load balancing in a trading system to conserve resources and increase throughput.

**As per claim 14**, Mulinder teaches wherein the intermediate layer further comprises: a plurality of the quote servers (See paragraph 11-13 & 43-44, which discusses a quote engine capable of providing a plurality of quotes, each of which has a specified duration; and processors ¶0064).

However, Mulinder does not disclose a load balancer that interfaces with the front end applications with the plurality of quote servers, the load balancer being configured to distribute quote activity requests among the plurality of quote servers.

Bowman-Amuah discloses a load balancer that mediates the request, otherwise known as workload balancing (See figure 151 and column 98, lines 22-49, which discusses how load balancing functionality effectively reduces the number of connections to databases, conserves the resources of the data servers, and increases throughput of the system). Therefore, it would have been obvious to someone of ordinary skill in the art at the time the invention was made to modify Mulinder to include a load balancer capable of distributing quote activity requests over a plurality of servers as taught by Bowman-Amuah in order to combine the known features of trading systems and load balancing to achieve the predictable result of utilizing load balancing in a trading system to conserve resources and increase throughput.

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**Claim 15** recites equivalent limitations to claims 12-14, respectively, and is therefore rejected using the same art and rationale set forth above.

8. **Claims 17, 19, 22-26, 83-86 & 97** are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulinder and Garg as applied to claims 3 and 16 above, and further in view of Official Notice.

**As per claim 17**, Mulinder does not disclose wherein the resident memory is application-in-memory cache.

The Examiner takes Official Notice that it is old and well known in the art to store memory on a cache. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Mulinder to include storing memory on an application-in-memory cache in order to making accessing memory a faster process.

**Claim 19** recites equivalent limitations to claim 17 and is therefore rejected using the same art and rationale set forth above.

**As per claim 22**, Mulinder does not disclose wherein a plurality of the front end applications are heterogeneous applications configured to communicate with the intermediate layer through a plurality of common component object model (COM) objects.

Toffey discloses multiple heterogeneous applications, including a computer, telephone, and a personal digital assistant (PDA) (See paragraphs 60 & 68, which discusses executing trades via telephone, computer, or PDA). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to

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modify Mulinder to include a plurality of heterogeneous applications including a computer, a telephone, and a PDA as taught by Toffey in order to provide multiple applications for executing a financial trade.

Furthermore, the Examiner takes Official Notice that it is old and well known in the art to use component object model to assemble programs or add functionality to existing programs. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the Mulinder and Toffey combination to include a component object model in order to link programs and add functionality.

**As per claim 23**, Mulinder teaches order activity requests stored on an order server (See paragraphs 12 & 44, which discusses processing a trade in a security).

However, the Mulinder and Toffey combination does not disclose wherein the front layer COM objects include a COM object for communicating order activity requests to the order server.

The Examiner takes Official Notice that it is old and well known in the art to use component object model to assemble programs or add functionality to existing programs. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the Mulinder and Toffey combination to include a component object model that allows communication with order requests on an order server in order to link programs and add functionality.

**As per claim 24**, Mulinder teaches wherein the intermediate layer further comprises at least one trading administration database for storing administrative



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restrictions related to activity requests (See paragraphs 46 & 49, which discusses spread rules and dealer intervention rules).

However, the Mulinder and Toffey combination does not disclose wherein the front end layer COM objects further include COM object for validating an order activity request against restrictions stored in the trading administration database prior to forwarding that order activity request to the order server.

The Examiner takes Official Notice that it is old and well known in the art to use component object model to assemble programs or add functionality to existing programs. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the Mulinder and Toffey combination to include a component object model capable of validating trade requests against intervention in order to link programs and add functionality.

**As per claim 25**, Mulinder teaches customer account activity requests stored on a customer account server (See paragraphs 13, 43, & 49, which discusses monitoring a clients trading patterns and market activity, thereby creating a client account; and, furthermore, a communication server that manages access to trading services; it is inherent the system contains memory).

However, the Mulinder and Toffey combination does not disclose wherein the front end layer COM objects further include a COM object for communicating customer account activity requests to the customer account server.

The Examiner takes Official Notice that it is old and well known in the art to use component object model to assemble programs or add functionality to existing

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programs. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the Mulinder and Toffey combination to include a component object model that allows communication with customer account activity requests on an customer account server in order to link programs and add functionality.

**As per claim 26**, Mulinder teaches quote activity requests stored on a quote server (See paragraphs 11-13 & 43-44, which discusses a quote engine capable of providing a plurality of quotes, each of which has a specified duration).

However, the Mulinder and Toffey combination does not disclose wherein the front end layer COM objects further include a COM object for communicating quote activity requests to the quote server.

The Examiner takes Official Notice that it is old and well known in the art to use component object model to assemble programs or add functionality to existing programs. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the Mulinder and Toffey combination to include a component object model that allows communication with quote activity requests on an quote server in order to link programs and add functionality.

**Claims 83-86** recite equivalent limitations to claims 22-23 & 25-26, respectively, and are therefore rejected using the same rationale set forth above.

**As per claim 97**, Mulinder teaches wherein the customer account server is further configured to (1) check the application-in-memory cache for fresh customer account data when processing an activity request before accessing the back end data

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repository for such customer account data, (2) use the fresh customer account data to process that activity request if the fresh customer account data is present in the application-in-memory cache, and (3) access the back end data repository for such customer account data if fresh customer account data is not present in the application-in-memory cache (See figure 6, and paragraph 6, which illustrates and discusses processing a trade request; and, furthermore, how it is well known in the art to automatically update data or requests).

**9. Claims 32, 34 & 35**, are rejected under 35 U.S.C. 103(a) as being unpatentable by Mulinder.

**As per claim 32**, Mulinder et al. teaches an automated brokerage system (See abstract, which discusses a system for real-time trading services), the system comprising:

a plurality of applications configured to generate activity requests related to one or more financial instruments in response to input from remote users, the activity requests comprising any of the group consisting of order activity requests, customer account activity requests, and quote activity requests (See paragraphs 9 & 45, which discusses multiple applications, including a price request application program interface for trading securities);

at least one order server configured to process the order activity requests (See paragraphs 12 & 44, which discusses processing a trade in a security);

at least one customer account server configured to process the customer account activity requests (See paragraphs 13 & 49, which discusses monitoring a clients trading patterns and market activity, thereby creating a client account);

at least one quote server configured to process the quote activity requests (See paragraphs 11-13 & 43-44, which discusses a quote engine capable of providing a plurality of quotes, each of which has a specified duration);

at least one quote data source in communication with the at least one quote server, the quote data source being configured to provide financial instrument quote data to the quote server (See paragraphs 11-13 & 43-44, which discusses a quote engine capable of providing a plurality of quotes, each of which has a specified duration, when processing a trade in a security);

at least one data repository in communication with the at least one customer account server and the at least one order server, the data repository being configured to store customer account data and provide stored customer account data to the customer account server (See paragraphs 50 & 64, which discusses using a conventional database management system and processing a transaction utilizing client account information); and

at least one order placement system in communication with the order server, the order placement system being configured to place one or more orders received from the order server on a financial instrument trading market, the one or more orders being derived from at least one order activity request (See figures 1 & 2, which illustrates the system for providing trading services).

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Mulinder et al. discloses all the elements of the claimed invention, however, Mulinder et al. does not disclose utilizing multiple servers and a respective placement system.

It would have been an obvious matter of design choice to include multiple servers: order server, customer server, quote server, and a placement system, since Applicant has not disclosed that adding an order server, customer server, quote server, and a placement system is for any particular purpose, and it appears that the invention would perform equally well with one server/system containing multiple applications. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Mulinder et al. to include multiple servers with multiple applications and data sources in order to allocate the tasks to various applications and servers to help reduce bandwidth bottlenecks and to help increase the benefits from economies of scale in addition to offering increased security, excellent data management, fast response, and room for expansion.

**Claim 34** recites equivalent limitations to claim 16, and is therefore rejected using the same art and rationale set forth above.

**As per claim 35**, Mulinder teaches wherein the order server is further configured to, when processing order activity requests, generate quote activity requests for communication to the quote server, and wherein the quote server is further configured to provide quote data that has been obtained in response to the quote activity request received from the order server to the order server (See paragraphs 11-13 & 43-44,

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which discusses processing a trade in a security requests and a quote engine capable of providing a plurality of quotes, each of which has a specified duration).

**10. Claim 33** is rejected under 35 U.S.C. 103(a) as being unpatentable over Mulinder as applied to claim 32 above, and further in view of Bowman-Amuah.

**Claim 33** recites equivalent limitations to claims 12-14 above, and is therefore rejected using the same art and rationale set forth above.

**11. Claims 91-93** are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulinder as applied to claim 82 above, and further in view of Toffey, Pub. No. 2004/0236668 (hereinafter Toffey).

**As per claims 91-93**, Mulinder does not disclose the following:

- wherein the plurality of heterogeneous applications comprises at least two selected from the group consisting of: a web site, a telephone, a touchtone telephone, a voice recognition application, a cell phone, a pager, a personal digital assistant, a computer, a Windows trading application server, and a Java trading application server;
- wherein the plurality of heterogeneous applications comprises at least three selected from the group consisting of: a web site, a telephone, a touchtone telephone, a voice recognition application, a cell phone, a pager, a personal digital assistant, a computer, a Windows trading application server, and a Java trading application server; and

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- wherein the plurality of heterogeneous applications comprises a web site, a cell phone, a personal digital assistant, a computer, a Windows trading application server, and a Java trading application server.

Toffey discloses multiple heterogeneous applications, including a computer, telephone, and a personal digital assistant (PDA) (See paragraphs 60 & 68, which discusses executing trades via telephone, computer, or PDA). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Mulinder to include a plurality of heterogeneous applications including a computer, a telephone, and a PDA as taught by Toffey in order to provide multiple applications for executing a financial trade.

### ***Response to Arguments***

**12.** Applicant's arguments, see pgs. 13-21, filed June 10, 2009, with respect to the rejections of **claims 1, 2, 3, 82, 91-93 & 98** under 35 U.S.C. § 103(a) have been fully considered and are persuasive. Therefore, the rejections are withdrawn. However, upon further consideration, new grounds of rejection have been applied based on the disclosures and teachings of Garg.

**Applicant's arguments** (pgs. 13-21) are essentially directed to the following claimed elements:

- (a) a front end layer, an intermediate layer and a back end layer
- (b) applications distributed across separate dedicated servers

**In Response to (a):** Applicant's arguments are moot in view of the new grounds of rejection based on the disclosures and teachings of Garg.

**In Response to (b):** The Examiner respectfully disagrees with Applications assertion (see pg. 21) that "Mulinder fails to disclose that these tasks should be distributed across separate dedicated servers. Instead, Applicant interprets Mulinder such that these tasks are different software modules executing on the same processor platform."

Figure 2 illustrates a block diagram of the Mulinder invention, which comprising modules, managers, etc. However, Mulinder explicitly recites that the invention can be implemented in one or more computer programs that are executable on a programmable system including *at least one programmable processor* coupled to receive data and instructions from, and to transmit data and instructions to, a data storage system, at least one input device, and at least one output device. Mulinder also discloses alternate embodiments of the invention *can be implemented in hardware*, firmware or a combination of both hardware and software, as well as *distributing modules* and/or data in a different fashion (would) be apparent to those skilled in the art. A reasonable interpretation is that each of the managers/modules can be implemented in separate servers (i.e. ¶0064 discusses various design choices for implementing the functional logic blocks of the invention).



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**13.** Applicant's arguments (pg. 2) regarding **claim 32** have been fully considered but they are not persuasive. See the response to **(b)** above.

**14.** The rejections of **claims 17, 19, 22-26 & 83-86** included a rejection based on Office Notice. MPEP 2144.03.C recites:

If applicant does not traverse the examiner's assertion of official notice or applicant's traverse is not adequate, the examiner should clearly indicate in the next Office action that the common knowledge or well-known in the art statement is taken to be admitted prior art because applicant either failed to traverse the examiner's assertion of official notice or that the traverse was inadequate. If the traverse was inadequate, the examiner should include an explanation as to why it was inadequate.

Accordingly, the Office Notice statements made by the previous Examiner in rejecting claims 17, 19, 22-26 & 83-86 in regards to "store memory on a cache" and "the use of component object model to assemble programs or add functionality to existing programs" as being old and well-known in the art has been taken to be admitted prior art because Applicant failed to traverse the Examiner's assertions.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GREGORY JOHNSON whose telephone number is (571)272-2025. The examiner can normally be reached on Monday - Friday, 8:30AM - 5:00PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, ALEXANDER KALINOWSKI can be reached on (571) 272-6771. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Alexander Kalinowski/  
Supervisory Patent Examiner, Art Unit 3691

GREGORY JOHNSON  
Examiner, Art Unit 3691